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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/804,326	03/18/2004	Stephen Robertson	14917.0135US01/MS306779.0	7299
27488 7590 06/07/2007 MERCHANT & GOULD (MICROSOFT) P.O. BOX 2903 MINNEAPOLIS, MN 55402-0903			EXAMINER COLAN, GIOVANNA B	
			ART UNIT	PAPER NUMBER
			2162	
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**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

# Office Action Summary

Application No.

10/804,326

Applicant(s)

ROBERTSON ET AL.

Examiner

Giovanna Colan

Art Unit

2162

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 16 March 2007.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-51 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-51 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

## Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

## Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)            | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | Paper No(s)/Mail Date. _____                                      |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>01/25/2007</u> .  | 6) <input type="checkbox"/> Other: _____                          |

### **DETAILED ACTION**

1. This action is issued in response to applicant filed application on 03/16/2007.
2. Claims 1 – 51 are pending.
3. The information disclosure statement (IDS) submitted on 01/25/2007. The submission is in compliance with the provisions of 37 CFR 1.97. Accordingly, the information disclosure statement is being considered by the examiner.
4. Applicant's arguments with respect to claims 1 – 51 have been considered but are moot in view of the new ground(s) of rejection.

### ***Claim Rejections - 35 USC § 112***

5. The following is a quotation of the second paragraph of 35 U.S.C. 112:  

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.
6. Claims 40, 41, 46, and 47 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

The term "BM25" in claims 40, 41, 46, and 47 is not defined by the claim language which renders the claim indefinite. The term "BM25" is not defined by the claim, the specification does not provide a standard for ascertaining the requisite degree, and one of ordinary skill in the art would not be reasonably apprised of the scope of the invention.

**Appropriate correction is required.**

***Claim Rejections - 35 USC § 103***

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

9. Claims 1 – 39, 42 – 45, and 48 – 51 are rejected under 35 U.S.C. 103(a) as being unpatentable over Robert John Fleischer (Fleischer hereinafter) (US Patent No. 5,960,383) in view of Brin et al. (Brin hereinafter) (Non-Patent Literature: "The Anatomy of a Large-Scale Hypertextual Web Search Engine", Sergey Brin and Lawrence Page, Stanford University, Stanford, CA, April 14, 1998).

Regarding Claims 1, and 9, Fleischer discloses a computer program product encoding a computer program for executing on a computer system a computer process

for determining a field-weighted score for a document having multiple fields relative to a query having a plurality of query terms, the computer process comprising:

replicating each field of the document in accordance with a field weight corresponding to the field to produce an individual field set corresponding to each field in the document (Col. 3 and 4, lines 14 – 18 and 26 – 34, “This would be done by simply by ranking the paragraphs ...Once the top “n” paragraphs are identified by the section ranks 28, the Extractor 20 copies these paragraphs from the input documents...”; respectively, Fleischer);

combining each field set for the document into a virtual document (Col. 5, lines 39 – 42, “output file”, Fleischer).

Fleischer also discloses: indexing the virtual document (Col. 4, lines 39 – 44, Fleischer). However, Fleischer does not explicitly disclose virtual statistics. On the other hand, Brin discloses: indexing the virtual document to produce a virtual document statistics (Page 10, Section 4.2.3, para.1, lines 1- 5, The document index keeps information about each document ... the information store in each entry includes the current document status, ... and various statistics ..., Brin).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the Brin’s teachings to the system Fleischer. Skilled artisan would have been motivated to do so, as suggested by Brin (Page 10, Section 4.2.3 Document Index, para. 1, Brin), to have a reasonably compact data structure, and to fetch a record in one disk seek during a search. In addition, both of the references (Fleischer and Brin) teach features that are directed to analogous art and they are

directed to the same field of endeavor, such as, databases management systems, indexing, and frequencies. This close relation between both of the references highly suggests an expectation of success.

Furthermore, the combination of Fleischer in view of Brin discloses:

computing the field-weighted score from the virtual document index based on the query (Page 15, Section 4.5.1, para. 2, lines 16 – 23, to compute an IR score for the document, Brin).

Regarding Claims 2, and 10, the combination of Fleischer in view of Brin discloses a computer program product wherein the query is associated with a search (Page 14, Section 4.5, Table o the right side: #4 and #5, the search terms, Brin) and the field-weighted score represents a level of relevance of the document to the query (Page 15, Section 4.5.1, para. 2, lines 16 – 23, take the dot product of the vector of count-weights with the vector of type-weights to compute an IR score, Brin).

Regarding Claims 3, and 11, the combination of Fleischer in view of Brin discloses a computer program product wherein each field weight is represented by an integer value and the replicating operation comprises:

generating each field set to include a number of copies of a field of the document, wherein the number of copies equals the integer value (Page 10, Section 4.2.5, para. 4, lines 1 – 7, Brin<sup>1</sup>).

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<sup>1</sup> Wherein a list of occurrences of a particular word corresponds to each field set as claimed.

Regarding Claims 4, and 12, the combination of Fleischer in view of Brin discloses a computer program product of claim 9 wherein the replicating operation comprises:

concatenating copies of one of the fields into a field set (Page 10, Section 4.2.4, para. 3, lines 6 – 8, Brin).

Regarding Claims 5, and 13, the combination of Fleischer in view of Brin discloses a computer program product of claim 9 wherein the combining operation comprises:

concatenating each field set into the virtual document (Page 10, Section 4.2.4, para. 3, lines 6 – 8, Brin).

Regarding Claims 6, and 14, the combination of Fleischer in view of Brin discloses a computer program product of claim 9 wherein the computing operation comprises:

computing a field-weighted document weight for each query term in the query from the virtual document statistics (Page 11, Table: Forward Barrels: total 43 GB, Brin<sup>2</sup>).

Regarding Claims 7, and 15, the combination of Fleischer in view of Brin

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<sup>2</sup> Wherein the nhits:8 corresponds to the field-weighted document weight as claimed.

discloses a computer program product wherein the computing operation comprises:

- computing a field-weighted document weight for each query term in the query from the virtual document statistics (Page 15, Section 4.5.1, para. 2, lines 18 – 20, a count-weight, Brin); and

- computing the field-weighted score based on the field-weighted document weight for each query term (Page 15, Section 4.5.1, para. 2, lines 20 – 23, Brin).

Regarding Claims 8, and 16, the combination of Fleischer in view of Brin discloses a computer program product further comprising:

- ranking the field-weighted score with field-weighted scores of other documents (Page 12, Section 4.2.7, para. 2, lines 2 – 6, ... ranking of the occurrence ..., Brin).

Regarding Claims 17, 26, and 35, the combination of Fleischer in view of Brin discloses a system for determining a field-weighted score for a document having multiple fields relative to a query having a plurality of terms, the system comprising:

- a field-weighted term frequency calculator that determines a field-specific term frequency for each field in the document for each query term and weights each field-specific term frequency according to a field weight identified for the corresponding field to compute a field-weighted term frequency for each query term (Col. 1, lines 38 – 41 and 55 – 59, Fleischer; and Page 8, and 12, Section 4.1, and 4.2.7, para. 3, and 3, lines 13 – 18, and 3 – 6, the indexer; respectively, Brin);

- a field-weighted document weight calculator that computes a field-weighted



document weight for each query term based on the field-specific term frequency for each query term (Col. 4, lines 44 – 51, Fleischer; and Page 8, and 12, Section 4.1, and Section 4.2.7, para. 3, and 3, lines 13 – 18, and 2 – 6; respectively, Brin); and

a document score calculator that computes the field-weighted score as a function of the field-weighted document weight of all query terms (Col. 5, lines 22 – 24; Fleischer; and Page 15, Section 4.5.1, para. 2, lines 20 – 23, The Ranking System, Brin).

Regarding Claims 18, 27, and 36, the combination of Fleischer in view of Brin discloses a system of claim 35 wherein the query is associated with a search (Page 14, Section 4.5, Table o the right side: #4 and #5, the search terms, Brin) and the field-weighted score represents a level of relevance of the document to the query (Page 15, Section 4.5.1, para. 2, lines 16 – 23, take the dot product of the vector of count-weights with the vector of type-weights to compute an IR score, Brin).

Regarding Claims 19, 28, and 37, the combination of Fleischer in view of Brin discloses a system further comprising:

a field-weighted document length calculator that computes a field-weighted document length based on a field weight for each field and a field length for each field, wherein the field-weighted document weight calculator computes a field-weighted document weight for each query term based on the field-weight term frequency for each query term and the field-weighted document length (Page 11, Section 4.2.5, para. 2,

lines 1 – 15, length of the hit list, Brin).

Regarding Claims 20, and 29, the combination of Fleischer in view of Brin discloses a computer program product wherein the computer process further comprises:

computing a field-weighted document length based on a field weight for each field and a field length for each field by summing one or more weighted field lengths of the fields in the document, each weighted field length being a field length weighted by a corresponding field weight (Page 11, and 15, Section 4.2.5, and 4.5.1, para. 2, and 2, lines 1 – 15, and 16 – 22, length of the hit list; respectively, Brin).

Regarding Claims 21, and 30, the combination of Fleischer in view of Brin discloses a computer program product wherein the computer process further comprises:

computing a field-weighted document length based on a field weight for each field and a field length for each field by summing one or more weighted field lengths of the fields in the document, each weighted field length being a field length weighted by a corresponding field weight (Page 11, and 15, Section 4.2.5, and 4.5.1, para. 2, and 2, lines 1 – 15, and 16 – 22, length of the hit list; respectively, Brin), wherein the operation of computing a field-weighted document weight comprises computing a field-weighted document weight for each query term based on the field-weight term frequency for each query term and the field-weighted document length (Page 15, Section 4.5.1, para. 2, lines 16 – 19, ... counts the number of hits of each type in the hit list. The very count is converted into a count-weight ..., Brin).

Regarding Claims 22, and 31, the combination of Fleischer in view of Brin discloses a computer program product wherein the determining operation comprises:

determining the field-specific term frequency for each field from document statistics associated with the document, the document statistics including a field-weighted term frequency for at least one query term in the document (Page 15, Section 4.5.1, para. 2, lines 8 – 17, Brin).

Regarding Claims 23, and 32, the combination of Fleischer in view of Brin discloses a computer program product wherein the determining operation comprises:

determining the field length for each field from document statistics associated with the document (Page 11, Section 4.2.5, para. 2, lines 1 – 6, Brin).

Regarding Claims 24, and 30, the combination of Fleischer in view of Brin discloses a computer program product wherein the operation of computing a field-weighted document weight comprises:

summing one or more weighted field-specific term frequencies of the fields in the document (Page 10, Section 4.2.4, para.3, lines 6 – 9, Brin).

Regarding Claims 25, and 34, the combination of Fleischer in view of Brin discloses a computer program product further comprising:

ranking the field-weighted score with field-weighted scores of other documents

(Page 12, Section 4.2.7, para. 2, lines 2 – 6, ... ranking of the occurrence ..., Brin).

Regarding Claims 38, 44, and 50, the combination of Fleischer in view of Brin discloses a system for determining a field-weighted score for a document having multiple fields relative to a query having a plurality of query terms, the system comprising:

a field-weighted term frequency calculator that computes a field-weighted term frequency for each query term based on field weights designated for individual fields in the document (Col. 1, lines 38 – 41 and 55 – 59, Fleischer; and Page 11, Section 4.2.5, para. 1, lines 1 – 5, Brin);

a field-weighted document weight calculator that computes a field-weighted document weight for each query term based on the field-weighted term frequency for each field in the document (Col. 4, lines 44 – 51, Fleischer; and Page 8, and 12, Section 4.1, and Section 4.2.7, para. 3, and 3, lines 13 – 18, and 2 – 6; respectively, Brin); and

a search engine that computes the field-weighted score as a function of the field-weighted document weights of the query terms (Col. 5, lines 22 – 24; Fleischer; and Page 15, Section 4.5.1, para. 2, lines 20 – 23, The Ranking System, Brin).

Regarding Claims 39, 45, and 51, the combination of Fleischer in view of Brin discloses a system further comprising:

a field-weighted document length calculator that computes a field-weighted document length based on a field weight for each field and a field length for each field,

wherein the field-weighted document weight calculator computes a field-weighted document weight for each query term based on the field-weight term frequency for each query term and the field-weighted document length (Page 11, Section 4.2.5, para. 2, lines 1 – 15, length of the hit list, Brin).

Regarding Claims 42, and 48, the combination of Fleischer in view of Brin discloses a computer program product wherein computing a field-weighted document weight comprises:

computing the field-weighted document weight using a factor reflecting a dependence on a number of the fields in the document in which a query term occurs (Page 15, Section 4.5.1, para. 2, lines 18 – 20, a count-weight, Brin).

Regarding Claims 43, and 49, the combination of Fleischer in view of Brin discloses a computer program product wherein computing a field-weighted score comprises:

computing the field-weighted score using a factor reflecting a dependence on which field in the document includes the most query terms (Page 15, Section 4.5.1, para. 2, lines 16 – 23, to compute an IR score for the document, Brin).

10. Claims 40, 41, 46, and 47 are rejected under 35 U.S.C. 103(a) as being unpatentable over Robert John Fleischer (Fleischer hereinafter) (US Patent No. 5,960,383) in view of Brin et al. (Brin hereinafter) (Non-Patent Literature: "The Anatomy

of a Large-Scale Hypertextual Web Search Engine", Sergey Brin and Lawrence Page, Stanford University, Stanford, CA, April 14, 1998), and further in view of Agichtein et al. (Agichtein hereinafter) (US patent No. 2002/0169595 A1, published: November 14, 2002).

Regarding Claims 40, and 46, the combination of Fleischer in view of Brin discloses all the limitations as disclosed above including computing the field weighted document weighting function. However, the combination of Fleischer in view of Brin does not explicitly disclose BM25. On the other hand, Agichtein discloses: using a field-weighted free parameter of a BM25 document weighting function, the field-weighted free parameter being based on a corresponding optimized free parameter computed in a non-field-weighted configuration (Page 3, and 4, [0035], [0037, and [0049]; respectively, Agichtein). It would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the Agichtein's teachings to the system of the combination of Fleischer in view of Brin. Skilled artisan would have been motivated to do so, as suggested by Agichtein (Page 1, [0008], lines 1 – 9, Agichtein), to automatically expand a query based on the co-occurrence of terms in the query with the terms in the top-ranked documents for the original query. In addition, the applied references (Fleischer, Brin, and Agichtein) teach features that are directed to analogous art and they are directed to the same field of endeavor, such as, databases management systems, weighting query terms, and searching. This close relation between the applied references highly suggests an expectation of success.

Regarding Claims 41, and 47, the combination of Fleischer in view of Brin and further in view of Agichtein discloses a computer program product wherein computing a field-weighted document weight comprises:

computing the field-weighted document weight using a field-weighted free parameter of a BM25 document weighting function, the field-weighted free parameter being based on an average term frequency over all terms in a non-field-weighted configuration, an average term frequency over all terms in a field-weighted configuration, and a corresponding optimized free parameter computed in the non-field-weighted configuration (Page 3, and 4, [0035], [0037, and [0049]; respectively, Agichtein).

***Response to Arguments***

1. Applicant argues that the 35 U.S.C. 112 second paragraph rejection, with respect to claims 40, 41, 46, and 47, should be removed; by specifically arguing that; "the BM25 ranking formula is well known in the art" and that; "The specification recited that "[o]ne specific implementation is based on the BM25 ranking formula...".

Examiner respectfully disagrees. As applicant argument relates to a "BM25 ranking formula"; however, claims 40, 41, 46, and 47 recite "BM25 document weighting function". Therefore, the 35 U.S.C. 112 second paragraph rejection is maintained.



***Prior Art Made Of Record***

1. Brin et al. (Brin hereinafter) (Non-Patent Literature: "The Anatomy of a Large-Scale Hypertextual Web Search Engine", Sergey Brin and Lawrence Page, Stanford University, Stanford, CA, April 14, 1998).
2. Agichtein et al. (Agichtein hereinafter) (US patent No. 2002/0169595 A1, published: November 14, 2002).
3. Robert John Fleischer (Fleischer hereinafter) (US Patent No. 5,960,383).

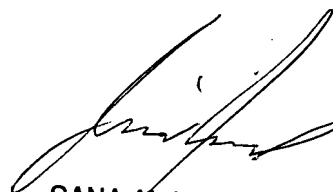
***Points Of Contact***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Giovanna Colan whose telephone number is (571) 272-2752. The examiner can normally be reached on 8:30 am - 5:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, John Breene can be reached on (571) 272-4107. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Giovanna Colan  
Examiner  
Art Unit 2162  
June 5, 2007

  
SANA AL-HASHEMI  
PRIMARY EXAMINER